

FINAL SUBMITTAL

ENERGY SURVEYS OF  
ARMY INDUSTRIAL FACILITIES  
ENERGY ENGINEERING ANALYSIS PROGRAM  
RADFORD ARMY AMMUNITION PLANT  
RADFORD, VIRGINIA

VOLUME III  
SITE SURVEY FORMS

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PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS  
NORFOLK, VIRGINIA

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Marie Wakefield,  
Librarian Engineering

Radford Army Ammunition Plant  
List of Buildings Surveyed

Number	Bldg No	Name/Process	Location	Similar
1	266 -03	Refrigeration Equipment House	Ballistics Range	1
2	400 -00	Power House #1	Power	1
3	407 -00	Filter Plant & Pump Station	Plant Water	1
4	408 -00	River Pump House	Plant Water	1
5	409 -00	Filter Plant	Plant Water	1
6	419 -00	Drinking Water Plant	Plant Water	1
7	420 -02	Acid Waste Disposal (C-Line)	Waste Acid	1
8	421 -00	Inert Gas Producer & Burn Hse.	Inert Gas	1
9	424 -00	Sewage Disposal Plant	Waste Water	1
10	440 -00	Incinerator 6A	Incinerator	1
11	441 -00	Incinerator 6B	Incinerator	1
12	442 -00	Grind House	Incinerator	1
13	470 -00	Biological Treatment Building	Waste Water	1
14	700 -00	Air Compressor House	Acid	1
15	702 -00	Oxidation House	Acid	1
16	735 -02	NAC/SAC Plant	Acid	1
17	736 -00	NAC/SAC Cooling Tower	Acid	1
18	1000 -00	Cotton Linter Warehouse	NC, A&B-Line	1
19	1505 -00	Change House	Green, A-Line	3
20	1606 -00	Open Tank Air Dry	Sol. Recovery, A-Line	10
21	1611 -00	Solvent Recovery House	Sol. Recovery, B-Line	27
22	1674 -00	Water Dry House	Sol. Recovery, C-Line	32
23	1800 -00	Glaze House	Finish, A-Line	3
24	1827 -00	Final Blend House	Finish	4
25	1877 -00	Can Pack house	Finish	3
26	2000 -00	Cotton Linter Warehouse	NC, A&B-Line	2
27	2010 -00	Dry House and Conveyer	NC, B-Line	3
28	2019 -00	Boiling Tub House	NC, B-Line	3
29	2022 -00	Beater House	NC, B-Line	3
30	2024 -00	Poacher & Blending House	NC, B-Line	3
31	2026 -00	Final Wringer House	Green, B-Line	3
32	2046 -00	Control House	NC, B-Line	2
33	2050 -00	Molecular Sieve Building	NC, B-Line	2
34	2500 -00	Dehy Press House	Green, B-Line	3
35	2506 -00	Diphenylamine Mix House	Green, B-Line	3
36	2508 -00	Mix House	Green, B-Line	6
37	2510 -00	Pre. & Horizontal Press House	Green, B-Line	9
38	2516 -00	Finishing Press & Cut House	Green, B-Line	4
39	2521 -00	Hydraulic Pump House	Green, B-Line	3
40	2555 -00	Activated Carbon Vapor Recov.	Green, B-Line	3
41	3513 -00	C-1 Press & Cutting House	Green, C-Line	3
42	3523 -00	Cooling Tower	Green, C-Line	2
43	3647 -00	Premix House Number 1	NG #1	2
44	3805 -00	Glycerin/Soda/Refrig. House	NG #1	1
45	4329 -00	Power House #2	Cast Prop. (Rocket)	1
46	4903 -00	Inert Gas Producer & Burn Hse.	Inert Gas	1
47	4906 -00	Final Mix House	Green, C-Line	1
48	4908 -00	Press and Cutting House	Green, C-Line	3
49	4912 -03	MK 43 Sawing and Inhibiting	Cast Prop. (Rocket)	1
50	4912 -03	Vacuum & Air Conditioning Hse.	Cast Prop. (Rocket)	4

51	4912 -04	SG Evacuation and Casting	Cast Prop. (Rocket)	1
52	4912 -07	Pin Assembly *	Cast Prop. (Rocket)	1
53	4912 -11	LG Mold Loading House	Cast Prop. (Rocket)	2
54	4912 -15	Spiral Wrap House	Cast Prop. (Rocket)	1
55	4912 -27	SG Curing Hse.- Carpet Rolls	Cast Prop. (Rocket)	10
56	4912 -34	Forced Air Dry House	Pilot B	2
57	4912 -40	Forced Air Dry House	Pilot B	19
58	4915 -00	Small Grain Mold Assembly	Cast Prop. (Rocket)	1
59	4921 -00	Inspect/Clean NG Tanks *	Cast Prop. (Rocket)	1
60	4924 -01	LG Motor Load House	Cast Prop. (Rocket)	1
61	4924 -05	MK 43 Dowel Rod & Spiral Wrap	Cast Prop. (Rocket)	1
62	4924 -06	Machine and Saw House	Cast Prop. (Rocket)	1
63	4925 -00	MK 43 Finishing Operations	Pilot B	1
64	4951 -02	TOW Launch Saw House	Pilot B	1
65	5008 -01	15 Inch Press House	Pilot A	3
66	5010 -00	Igniter Assemble & Inspect	Igniter Line	1
67	6304 -00	Paste Blending House	1st R P	1
68	7104 -00	Diff. & Even Speed Roll House	1st R P	5
69	7106 -06	Dry House #6 (Dry Packing)	1st R P	7
70	7113 -00	Roll House (Rolled Powder)	1st R P (F-Line)	1
71	7113 -00	Cut, Mill, Bore & Trim	Grain Finish	1
72	7127 -00	Carpet Roll and Slitter House	1st R P	1
73	7801 -00	Extruded Grain Finishing	Grain Finish	2
74	9304 -00	Slurry Mix House	Premix 2	2
75	9309 -03	Rolled Powder Building	4th Rolled Powder	1
76	9309 -04	Rolled Powder Building	4th Rolled Powder	1
77	9310 -02	Rolled Powder Building	4th Rolled Powder	2
78	9334 -15	Blender House	4th Rolled Powder	1
79	9334 -17	Rest House	4th Rolled Powder	8
80	9354 -00	Compressor House	4th Rolled Powder	1
81	9465 -00	Glycerin/Soda/Sol/Refrig Hse.	NG #2	1
82	9467 -00	Generator House	NG #2	1
83	9488 -00	Compressor House	NG #2	1

Number of buildings represented by survey

255



# SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 4/10/90

Tom Pifer

Powerhouse costs YTD Feb '90 (Jan  $\frac{1}{2}$  Feb)

materials	\$ 1,039,960	coal
processing	490,999	\$ 919,408
	\$ 1,530,959	

kwh gen - 570,150

coal -	\$ 6,136,000	kwh -	82,323,000
mat -	7,224,000	cost	
processing -	2,773,830	gen -	2.963¢/kwh
total	9,997,561	puvd -	3.090¢/kwh

Steam \$ 2.25 / 1000 #/hr

Eg:  $0.0055 * \frac{\text{cost/MBtu}}{0.30} * \text{kwh} = \text{elec. cost}$

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 4/11/90

Security Lighting - Capt. Stanger

Clyde Morris is supervisor of line crew  
and installs lighting (located in Bldg. 512)

Fence lines are checked every hour by driving by  
also hand-check gates

This procedure makes using motion sensors  
on perimeter lighting impractical

There are 18 miles of fence at Radford.

# SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 4/11/90

Rewound motors - Marveta Dodley

• 60 Hp Marathon Open drip proof M-7297

Strip and clean stator

Rewind stator mat \$233

Replace bearings lab 542

Lin-Electric total \$775

Bluefield, W. Va.

• 15 Hp Westinghouse Pump Motor M-839

mat \$224

lab 988

tot \$1212

• 40 Hp Reliance Feedwater Pump M-6302

mat \$50

lab 520

tot \$570

• 25 Hp W'house Blower Motor

M-9398

mat \$114

lab 600

tot \$714

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 4/11/90

• 15 Hp GE

M - 7289

Clean

make stator coil

Total \$1224

Strip, rewind

VPI & ~~big~~ dip

replace leads

wash & bake rotor

bearings, new fan

test & repaint

• 125 Hp

M - 864

\$2100 - \$3800 bid

Also see Mike Turnmeyer X7676

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-10-89

Location of Building: Area: Ballistics; Bldg. #: 266-03

Process or Activity: Propellant is stored and tested  
under various conditions

Process Equipment List: \_\_\_\_\_

- 2 heated storage boxes
- 2 cooled storage boxes

Space Utilization: Industrial Process: 100%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): Incandescent & Fluorescent

Controls: \_\_\_\_\_

Building Description: Age: 38 years; Number of Floors: 1

Gross SqFt (from bldg list): 2232

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# LOW TEMPERATURE CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: BALL RANGE ; Bldg. #: 266-03

Service area or Loads: -40°F STORAGE FOR MOTOR CURING

## Compressors\*:

	Manuf	Type	Refrig	S-Press	D-Press	RAAP#
No. 1:	<u>FRICK</u>	<u>4x6</u> <u>RECIP.</u>	<u>A</u>			<u>118</u>
No. 2:	<u>FRICK</u>	<u>2-5x5</u> <u>RECIP.</u>	<u>A</u>			<u>120</u> <u>121</u>
No. 3:	<u>FRICK</u>	<u>11 1/2 x 8</u> <u>RECIP.</u>	<u>A</u>			<u>117</u>
No. 4:	<u>FRICK</u>	<u>2-ROTARY</u>	<u>A</u>			<u>135</u> <u>136</u>

## Pumps\*:

	Manuf	Model	GPM	S-Press	D-Press	RAAP#
Condenser:	<u>FRICK</u>	<u>EVAP. CONDENSER</u>				<u>RFA 123</u>
No. 2:	<u>KRACK</u>	<u>"</u>	<u>"</u>			<u>12FA 18251</u>
Ch. Water:						
No. 2:						

Cooling Tower\*: Manufacturer: \_\_\_\_\_; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets for all motors.

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: \_\_\_\_\_

NEW REFRIGERATION EQUIPMENT BEING  
INSTALLED.

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 1/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 266-03

Equipment Description/Use: RECIP. COMPRESSOR MOTOR

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: M 50

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 31 Phase 3 Hz 60

HP: 25; RPM: 1750; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 266-03

Equipment Description/Use: RECIP. COMPRESSOR MOTOR

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: 5276 ✓

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 51 Phase 3 Hz 60

HP: 40; RPM: 1170; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☐; Copies Obtained: Yes ☒ No ☐

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_



ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 246-03

Equipment Description/Use: RECIP. COMPRESSOR MOTORS

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: M 52 ✓ & M 53 ✓

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 26 Phase 3 Hz 60

HP: 20; RPM: 1760; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 246-03

Equipment Description/Use: ROTARY COMPRESSOR MOTORS

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: M61 ✓ M62 ✓

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 31 Phase 3 Hz 60

HP: 25; RPM: 1760; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 266-03

Equipment Description/Use: HOT BRINE PUMP MOTORS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 43 , M 47 , M 46 ✓

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 6.8 Phase 3 Hz 60

HP: 5 ; RPM: 1750 ; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No ; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 266-03

Equipment Description/Use: HOT BRINE PUMP MOTORS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 44 ε M 45 ✓

Manufacturer: LOUIS ALLIS

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 4.2 Phase 3 Hz 60

HP: 3; RPM: 1750; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes (No); Copies Obtained: Yes (No)

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BALL RANGE; Bldg. #: 266-03

Equipment Description/Use: EVAPORATIVE CONDENSER FAN  
MOTORS

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 6/90

Location of Building: Area: \_\_\_\_\_; Bldg. #: 400-00

Process or Activity: STEAM & Power GENERATION

Process Equipment List: 5-175,000 #/HR, 400PSIG, 750°F  
P.C. FIRED BOILERS. 2-6 MW FULL CONDENSING  
TURBINE GENERATORS WITH 260PSIG & 40 PSIG EXTRACTIONS  
FOR PROCESS. 2-6 MW BACK PRESSURE (40PSIG) TURBINE  
GENERATORS WITH 260 PSIG EXTRACTION. THESE 4  
T/G SETS ARE THE NEW CONFIGURATION - 92 COMPLETE INSTAL.

Space Utilization: Industrial Process: 100%; Other: —%

Schedule: Daily: 24H/D; Annual: 8760 HRS/YR

Lighting System Type(s): MIXED FLUORESCENT & INCAND.

Controls: BEING RENEWED

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 64,512

HVAC system(s) used for: Personal Comfort, \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# BOILER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 2/90

Location of Boiler: Area: Power house #1; Bldg. #: 400-00

Service Area or Loads: \_\_\_\_\_

Boiler Specifications: Type: \_\_\_\_\_; RAAP ID #: \_\_\_\_\_

Manuf & ~~Model~~ <sup>NO.</sup> #: COMBUSTION ENGINEERING 5

Operating: Capacity: 200,000 #/hr Press: 400 psig

Fuel(s) used: Type: P.C.; Input: 9.7 TPH

Steam produced: 200,000 #/hour; Temp: 750 (F)

Hot water produced: Flow Rate: —; Temp: — (F)

Other data: Stack Gas Temp 325; Excess Air % 20

Burner Type: R.O.

Operation Schedule: Daily: 24H/D

Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: PNEUMATIC

Maintenance Schedule: \_\_\_\_\_

Operating log available: Yes (No); Copies Obtained: Yes (No)

Feed Water Pretreatment: Heated: (Yes) No; Chemicals: (Yes) No

Auxiliary Equipment: ECON, PRECIP, D.A., New Blowers  
Pumps, Etc.  
Economizer  
Scrubber  
Soot Blower

Condensate Return: % (Est): 4-6; From \_\_\_\_\_

General Condition/Comments: ALL TURBINE GENERATORS OUT OF SERVICE DUE TO ACCIDENT.

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 407-00

Process or Activity: Stand-by condition  
Water Filtration

Process Equipment List: \_\_\_\_\_

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 8hr/da; Annual: 5d/wk

Lighting System Type(s): \_\_\_\_\_

Incandescent - ~ 20, 200 watt fixtures

Controls: \_\_\_\_\_

On-off switching

Building Description: Age: 35 years; Number of Floors: 2

Gross SqFt (from bldg list): 22,822

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 408-00

Process or Activity: River Pump House

Process Equipment List: Water pumps - moves water  
from river to Bldg #409.

2-450hp, 2-100hp, 2-600hp

Space Utilization: Industrial Process: 100 %; Other: - %

Schedule: Daily: 24h/da; Annual: 365d/yr

Lighting System Type(s): 12 ~ 200 watt incandescents

Controls: On-off at breaker box

Building Description: Age: 48 years; Number of Floors: 2

Gross SqFt (from bldg list): 4298

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/90

Location of Equipment: Area: \_\_\_\_\_; Bldg. #: 408-00

Equipment Description/Use: River water pumps

Process Line: Plant water

Motor Used For: pumps

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: Westinghouse

Model #: \_\_\_\_\_ Serial #: 1513P324FR320

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 2200 Amps 100 Phase 3 Hz 60

HP: 450; RPM: 1184; Design: \_\_\_\_\_

Operation Schedule: Daily: 24 h/da; Annual: 365 da/yr

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: Aug. load - 115 amps?

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: \_\_\_\_\_; Bldg. #: 408-00

Equipment Description/Use: Booster pump from the  
450 hp pumps to Bldg. 409

Process Line: Plant water

Motor Used For: Booster pump between 450 hp pumps  
and Bldg. #409

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: SK6316XC984 Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: 1.15

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps 25.2 Phase 3 Hz 60

HP: 100; RPM: 880; Design: \_\_\_\_\_

Operation Schedule: Daily: 24 h/da; Annual: 365d/yr

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: avg. load - 22 amps ea.

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/90

Location of Equipment: Area: \_\_\_\_\_; Bldg. #: 408-00

Equipment Description/Use: Turbine Pumps (vertical)(2)

Process Line: \_\_\_\_\_

Motor Used For: Moves water from river to #409

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: General Electric

Model #: 5K6336XC42A Serial #: AVJ120020

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: B; Service Factor: 1.00

Volts 2300 Amps 137 Phase 3 Hz 60

HP: 600; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: 24h/da; Annual: 365 da/yr

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: Aug load - 128 amps

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 409-00

Process or Activity: Water Plant

Pumps water from plant to storage tanks (4)  
Fire, Plant, Raw, Drinking

Process Equipment List: 9 - 300 hp pumps

2 - 100 hp pumps

Space Utilization: Industrial Process: 90 %; Other: 10 %

Schedule: Daily: 24 h/d; Annual: 365 d/yr

Lighting System Type(s): Fluorescent in office area

Controls: On-off switching

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 27,793

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 419-00

Process or Activity: Drinking water plant

Process Equipment List: 2 - 60 hp pumps, 2-40 hp pumps

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 h/day; Annual: 365 da/yr

Lighting System Type(s): 10 150-watt incandescents  
1 - fluorescent

Controls: On-off switching

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 8344

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 420-02

Process or Activity: C-Line Acid Waste Disposal Plant

Process Equipment List: ~~6-15hp~~ agitators run continuously - Treats acid from C-~~line~~ line by adding lime - 1 ~15hp pump and 2-5hp pumps agitate and circulate - 3-5hp motors run intermittently to deliver lime

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 24 h/da; Annual: 365d/yr.

Lighting System Type(s): 8 - ~200 watt incandescents

Controls: on-off switch

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 963

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

## BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 6/90

Location of Building: Area: GENERAL PLANT; Bldg. #: 4903-00

Process or Activity: INERT GAS GENERATION (IGG)

Process Equipment List: 2-15000 SCFH IGA'S ; 1-60,000 IGA'S  
1 PILLOW TANK, 2-300 psi INVERSOL RAND Compressors.  
1-320 psi IR compressor

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 H/D; Annual: 8760 H/yr

Lighting System Type(s): INCANDESCENT

Controls: \_\_\_\_\_

Building Description: Age: 36 years; Number of Floors:       

Gross SqFt (from bldg list): 557

HVAC system(s) used for: Personal Comfort ; \*Process Requirement.

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 424-00

Process or Activity: Sanitary Waste Water - Main Plant

Process Equipment List: Clarifier motors - other  
water pumps operate intermittently to move water  
from one area to another

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24h/d; Annual: 365d/yr

Lighting System Type(s): N/A

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 5250

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: Horseshoe-GP; Bldg. #: 440 & 441

Process or Activity: Waste propellant is incinerated  
with Fuel Oil

Process Equipment List:

- Incinerators (2) - 6A & 6B
- Cooling water pump - 10hp
- Burner fan - 25hp
- Stack fan - 50 hp

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 24 hrs; Annual: 365 days

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 13 years; Number of Floors: 1

Gross SqFt (from bldg list): NA

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: Horseshoe -GP; Bldg. #: 442-00

Process or Activity: Grind house - waste propellant  
is mixed with water, ground up and pumped to  
incinerators

Process Equipment List: \_\_\_\_\_

• Grinder - M6685

• Vibrating conveyor - small motor

• Circulating pumps - M6689 & M6690 (5hp)

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): Metal Halide (high bay)

Controls: \_\_\_\_\_

Building Description: Age: 13 years; Number of Floors: 1+

Gross SqFt (from bldg list): 4646

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 470-00

Process or Activity: Biological Waste Treatment Plant

Process Equipment List: 12 motors turn rotating  
biological contactors - 2 pumps circulate water

Space Utilization: Industrial Process: 100 %; Other: - %

Schedule: Daily: 24h/da; Annual: 365d/yr

Lighting System Type(s): 40 Mercury Vapor  
2 sodium vapor

Controls: on-off switch

Building Description: Age: 10 years; Number of Floors: 2

Gross SqFt (from bldg list): 13569

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

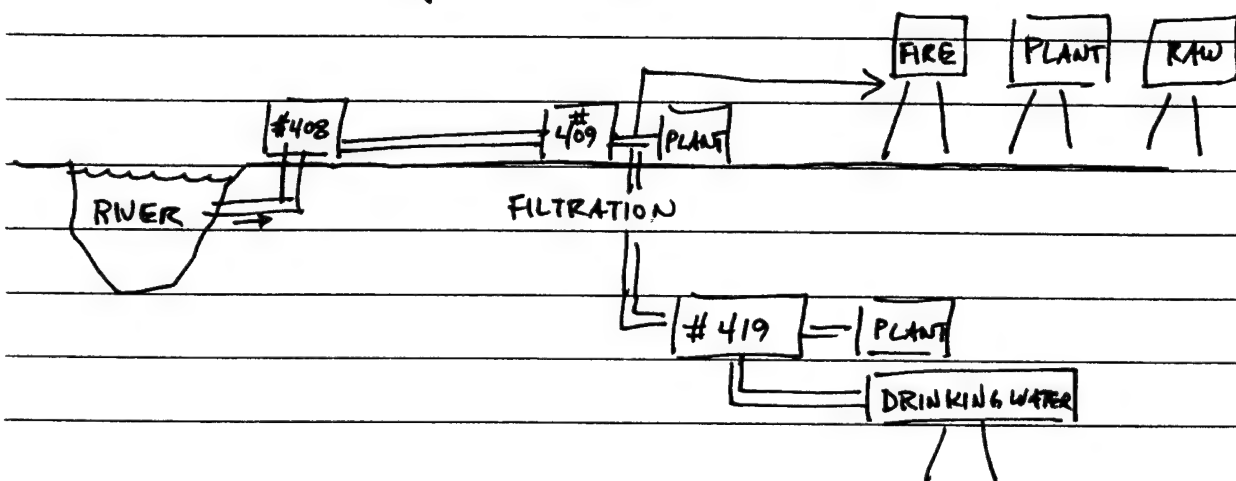
470-00

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/90

Plant water flow diagram



- Get tank heights from instrumentation
- Electricity use through electric shop PM

## SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Water &amp; Wastewater

Charlie Weeks

Waste Water Plants	Bldg. #
1 Biological	470
2 Waste acid	420-1, -2
2 Sanitary Sewage	424, 4325

Filtration Facility, Bldg #409

Capacity	33 million gal/da	
( $\frac{\text{mgal}}{\text{da}}$ ) Avg	14 million gal/da	
14 Filtered water	- 4 - 300 hp	2500 gpm
1 Fire water	- 1 - 300 hp	1500 gpm
3 Raw Water	- 4 - 300 hp	2500 gpm
2.4 Drinking Water	- 2 - 100 hp	
20.4		

to  
storage  
tanks

Pumps are PM'd twice during year  
Flash

470-00

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 4/11/90

Water Plant

Bill Shelton

- Usually operate 1 turbine plus a deep well  $\frac{1}{2}$  booster pump
- Operator at plant watches storage tank levels and turns pumps on and off based on that info.
- Probably has 3 hrs. capacity

River pumps operate continuously

Pumps ~ 24,000,000 gpd

Use ~ 14,000,000 gpd

The remainder flows back to river

Aerators in ~~the~~ Bldg 470

(8) 15 hp some agitators/injection

# COMPRESSOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/7/89

Location of Compressor: Area: \_\_\_\_\_; Bldg. #: 700-00

Service area or Loads: Plant Air and Nitric Acid (AOP)

Max Pressure Required: 120 psi(a,g)

Compressor Specifications: Type: Reciprocating; RAAP ID#: \_\_\_\_\_

Manuf. & Model #: Ingersoll-Rand Series C s/N 44242-3

Operating: Capacity: 2500 cfm at 120 psi(a,g)

Gas Type: Air; Supply Temp: Ambient

Electric Motor: Type: Synchronous ☒; Induction \_\_\_\_\_

Volts 2400 Amps 100 Phase \_\_\_\_\_ Hz \_\_\_\_\_  
180 RPM

HP \_\_\_\_\_; Mfg \_\_\_\_\_; Model \_\_\_\_\_

Steam: Flow Rate: \_\_\_\_\_/hr; Temp: \_\_\_\_\_ (F,C)

Press: Input: \_\_\_\_\_ psi; Exh: \_\_\_\_\_ psi

Operation Schedule: Daily: Operate 3 on weekday, 2 on weekend

Annual: \_\_\_\_\_

Cooling Method: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Items Serviced: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: Air dryer, heat recovery, etc

Heat Recovery Potential: Accessibility, heat load nearby

General Condition/Comments: Age - 12/21/40



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/7/89

Location of Building: Area: \_\_\_\_\_; Bldg. #: 700-00

Process or Activity: Compressor House

Process Equipment List: 7 electric compressors (2500cfm ea)  
4 energy recovery type (1850cfm)

Space Utilization: Industrial Process: 100 %; Other: - %

Schedule: Daily: 24h/da; Annual: 365d/yr

Lighting System Type(s): Mercury Vapor - 16 fixtures

Controls: On-off switch

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 13464

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11/7/89

Bldg # 700-00

Compressors:

3 elec. used for Plant 2500 cfm  
(3 on weekdays, 2 on weekends)

3 ~~elec~~ recovery types (XRD's) supply compressed  
air to nitric acid area (AOP) 1850 cfm ea.

2 elec also supply AOP - 3 -  $\frac{1}{3}$  of the time

There are 7 total elec compressors, 1 is good  
4 XRD's

Basic operating scheme is to full load several  
compressors and allow one to regulate

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/7/89

Location of Building: Area: Acid; Bldg. #: 702-00

Process or Activity: Oxidation House

Process Equipment List: 2-55 ton/day ammonia  
oxidation units - make 60% nitric acid using  
compressed air and anhydrous ammonia

Space Utilization: Industrial Process: 100%; Other:   %

Schedule: Daily: 24 h/d; Annual: 365 d/yr

Lighting System Type(s):   

Controls:   

Building Description: Age: 49 years; Number of Floors:   

Gross SqFt (from bldg list): 3266

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: ACID; Bldg. #: 735-02

Service area or Loads: COOLS ACID

Chiller Specifications: Type: CENT.; RAAP ID #: \_\_\_\_\_

Manufacturer & Model #: CARRIER 19EA8275DL

Operating Data: Capacity: 735 TONS

EVAP. NO. PASSES 1  
PR. DR. 18'

CHW Temps: 37 (supply), 51 (return)

COND. PASSES - 2  
PR. DR. 22.7'

Condenser Temps: 80 (sup), 90 (ret)

Compressor\*: Suction Pressure: \_\_\_\_\_; Discharge Pressure: \_\_\_\_\_

Refrigerant Type: R-12; Motor Horsepower: \_\_\_\_\_

Pumps\*:

Manuf Model GPM S-Press D-Press RAAP#

INPUT 647 KW  
AMPS 183

RFA  
20977  
24743  
20975

Condenser: GOULD 3475(EA) @ 145' HD

Ch. Water: \_\_\_\_\_

1400

1400

Cooling Tower\*: Manufacturer: ECODYNE; Model: 5/N P60 13238

\* Fill out Electric Motor Data sheets For all electric motors \*

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: CONTRACT WITH OUTSIDE FIRM

Operating log available: Yes (NO); Copies Obtained: Yes (NO)

Heat Recovery Potential: \_\_\_\_\_

Condenser accessible, heat load nearby

General Condition/Comments: FAIR - JUST REPAIRED - STARTER

BURNED - IN PROCESS OF BEING REPAIRED. PLANS ARE  
TO ELIMINATE USE OF THE CHILLER AND UTILIZE COOLING

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 1/8/89

Location of Equipment: Area: ACID; Bldg. #: 735-02

Equipment Description/Use: CENTRIFUGAL CHILLER MOTOR

Process Line: \_\_\_\_\_

Motor Used For: DRIVE CENTRIFUGAL CHILLER

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 2300 Amps 183 Phase 3 Hz 60

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: PLANS ARE TO ABANDON USE OF THE CHILLER AND RELY ON THE COOLING TOWER FOR ACID COOLING.

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: ACID; Bldg. #: 736-00 COOLING TOWER

Equipment Description/Use: COOLING TOWER FAN MOTOR

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: ACID; Bldg. #: 736-00  
735

Equipment Description/Use: CHILLED WATER PUMP MOTOR,  
ACID COOLING

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 7009, M 7010

Manufacturer: WESTINGHOUSE

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction V

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 112.0 Phase 3 Hz 60

HP: 100; RPM: 1775; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No \_\_\_\_\_; Copies Obtained: Yes No \_\_\_\_\_

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: COOLING TOWER WATER IS  
USED DIRECTLY TO BYPASS CHILLER

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/9/89

COOLING TOWER

Location of Equipment: Area: ACID; Bldg. #: 736-00

Equipment Description/Use: CONDENSER WATER PUMP  
MOTORS. FURNISHES COOLING WATER FOR BLDG.  
# 735

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 7013, M 7014, M 7015

Manufacturer: WESTINGHOUSE

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction V

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 480 Amps 222.0 Phase 3 Hz 60

HP: 200; RPM: 1775; Design: \_\_\_\_\_

Operation Schedule: Daily: AS NEEDED; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

SHOP DRAWINGS  
Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: APPEARS TO BE IN GOOD  
CONDITION



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/10/90

Location of Building: Area: NC-A, Green; Bldg. #: 1505-00

Process or Activity: Change house

Process Equipment List: None

Space Utilization: Industrial Process: 0 %; Other: 100 %

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): Fluorescents

Controls: Motion sensor - test - 1 bldg. only

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 2140

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: Finish-Sol.Rec.; Bldg. #: 1606-00

Process or Activity: Open tank air dry - outside air is heated to 150°F and injected through steel or copper tanks containing propellant (from water dry).  
Process remove water from propellant.

Process Equipment List: \_\_\_\_\_

- 5 air dry tanks
- 5 Heating (steam) systems with blowers + preheat pipes
- Elevator - 7.5 hp motor
- steam radiator comfort heating

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 3-16 hr cycles; Annual: \_\_\_\_\_

Lighting System Type(s): Incandescent throughout -  
about 20 exterior lights on during day

Controls: Each bay is separately switched  
but the switches turn on both inside and  
outside lights.

Building Description: Age: 48 years; Number of Floors: 2

Gross SqFt (from bldg list): 2566

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: SOLVENT RECOVERY; Bldg. #: 1611-00

Process or Activity: PROPELLANT IS HEATED WITH WARM  
INERT GAS TO DRIVE OFF ETHER & ALCOHOL.  
LIBERATED VAPORS ARE COLLECTED, CONDENSED,  
AND RECYCLED. INERT GAS IS RECYCLED.

Process Equipment List: 5 HEATING / COOLING LOOPS, ONE  
PER TANK.

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): INCANDESCENT. 45-150 WT  
BULBS - DEDICATED SWITCHES FOR EACH BAY.  
LIGHTS ON LESS THAN 4 HRS / DAY.

Controls: PNEUMATIC

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 2566

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: Finish-Sol. Rec.; Bldg. #: 1674-00

Process or Activity: Water Dry - propellant from solvent recovery is immersed in water heated to 150°F to remove residual solvents, ether & alcohol. 32 water dry buildings - 15 are active

Process Equipment List:

- 2 water dry tanks - 16' Diameter and 9' high
- 1 water receiving tank
- Hot water converters
- 2 small hot water pumps

Space Utilization: Industrial Process: 100 %; Other:        %

Schedule: Daily: 24 hrs; Annual: 365 days

Lighting System Type(s): Fluorescent

Controls:

Building Description: Age: 48 years; Number of Floors: 1+

Gross SqFt (from bldg list): 2936

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: FINISHING, A ; Bldg. #: 1800-00

Process or Activity: GLAZE BLDG. - MAT'L TUMBLER  
IN DRUM WITH GRAPHITE - GRAPHITE STICKS TO  
SURFACE OF MAT'L - 6 SIMILAR BUILDINGS

Process Equipment List: 15 HP DRUM MOTOR, 3 HP  
DRUM "Jockey" MOTOR, 5 HP DUST COLLECTOR  
MOTOR

Space Utilization: Industrial Process: \_\_\_\_\_ %; Other: \_\_\_\_\_ %

Schedule: Daily: 2 hr / shift <sup>10 shifts</sup> WK ; Annual: 43 day/yr.

Lighting System Type(s): 20- 150 Wt INCANDESCENTS

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 864

HVAC System(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: FINISHING ; Bldg. #: 1B27-00

Process or Activity: \_\_\_\_\_

GRAPHITE COATING

Process Equipment List: SIMILAR TO BLDG 1B00  
EXCEPT THIS PROCESS AUTOMATICALLY LOADS  
GRAPHITE COATING DRUM. DISCHARGES MAT'L  
TO BLDG 1B77 - PACKING OPERATION.  
150 HP CENTRIFUGAL EXHAUSTER OPERATES ONLY WHEN  
MAT'L IS BEING LOADED INTO DRUM.

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 9 H/D 7 D/WK ; Annual: 136.5 d/yr  
DRUM ONLY

Lighting System Type(s): 3 BULB FLUORESCENT

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 864

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: FINISHING; Bldg. #: 1877-00

Process or Activity: GRAPHITE COATING & PACKING  
AUTOMATICALLY REMOVES MAT'L FROM COATING  
DRUM AND FILLS SMALL CONTAINERS THAT ARE  
WEIGHED & COVERED AND PREPARED FOR TRANSPORT.

Process Equipment List: CONVEYOR BELTS, FILLING &  
WEIGHING EQUIPMENT. BUILDING IS HEATED -  
WOOD CONSTRUCTION, NO INSULATION. HEAT IS TO  
MAINTAIN MAT'L STABILITY.

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 15H/D 7D/WK; Annual: 5460 h/yr.

Lighting System Type(s): MIXTURE - MOSTLY FLUORESCENT.

Controls: FEW - MOSTLY HAND OPERATION.

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 1506

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Building: Area: NC-B; Bldg. #: 2000

Process or Activity: LINTER Storage

Process Equipment List: None - ~~purely~~ purely storage

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 7da/wk; Annual: 8 24h/da

Lighting System Type(s): 16 mercury vapor X 2 = 32

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 13902

NONE  
~~HVAC~~ system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Location of Equipment: Area: NC-B; Bldg. #: 2010-00

Process Line Description: Nitrocellulose manufacture - Dry house and conveyor

Description of Equipment: Bale Breaker / Dryer - shreds cotton bales with electric motor drive. Steam heat is used to dry cotton when required.

Equipment Specifications: Mfg: Saco-Lowell; Model: F4/45

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: (Yes) No; HW or (Steam) from PH # 1

Input: 40 psi #/hr, gpm <sup>Air</sup> Temp: 240 (F), (C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs; Annual: \_\_\_\_\_

Control System: Manual switch

Operating log available: Yes (No); Copies Obtained: Yes No

Auxiliary Equipment: <sup>small</sup> 5 blowers used when drying is required  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Location of Equipment: Area: NC-B; Bldg. #: 2010-00

Process Line Description: Nitrocellulose Manufacture - Dry  
house and conveyor

Description of Equipment: Wood pulp shredder - installed  
in December, 1941. Shreds 800 to 1000 lb rolls of wood pulp.

Equipment Specifications: Mfg: John Waldron; Model: SN 8287

Operating Data: Capacity: 20 <sup>ROLLS</sup> ~~parts gal lbs~~ / shift

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, complete motor form

Pneumatic <sup>Air</sup> Drive: (Yes) No; Compressor ID: Plant Air  
used to clear lines  
Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: (Yes) No; HW or Steam from PH # \_\_\_\_\_  
Available but not used  
Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_  
Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs; Annual: \_\_\_\_\_

Control System: Manual

Operating log available: Yes (No); Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/7/89

Location of Equipment: Area: NC-B; Bldg. #: 2010-00

Equipment Description/Use: \_\_\_\_\_

Process Line: Nitrocellulose

Motor Used For: Blower

Motor Specifications: RAAP ID #: M 2446

Manufacturer: Westinghouse

Model #: \_\_\_\_\_ Serial #: 4340

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: Belt

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 35.6 Phase 3 Hz 60

HP: 30; RPM: 1750; Design: \_\_\_\_\_

Operation Schedule: Daily: 15% in opn. 24h/da; Annual: 365d/yr

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: N/A  
Variable speed drive, etc

General Condition/Comments: Looks very old

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Location of Equipment: Area: NC-B; Bldg. #: 2019-00

Process Line Description: Nitrocellulose manufacture -  
Boiling tub house - cotton or pulp comes from continuous  
nitrator (2045) for removal excess acid

Description of Equipment: 27 stainless steel tubs - 30000  
pounds of cellulose per tub - 3 cycles of wash and

Equipment Specifications: Mfg: —; Model: —

Operating Data: Capacity: 30000 ~~parts gal~~ (lbs) / tub

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: Yes (No); If yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: —

Input: — CFM @ — psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: —

Process Heating: (Yes) No; HW or (Steam) from PH # 1

Input: — #/hr, gpm; Temp: 96 (F) (C) <sup>Water</sup>

Process Cooling: Yes (No); Chiller ID: —

Input: — gpm; CW Temp: — (S) — (R)

Operation Schedule: Daily: 24hrs <sup>Some</sup> tubs; Annual: —

Control System: Manual - auto installed but has problems

Operating log available: (Yes) No; Copies Obtained: Yes No

Auxiliary Equipment: Circulating pumps, heat recovery system  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors, insulate tubs

Heat Recovery Potential: heat recovery for NC-A and NC-C  
Accessibility, heat source/load nearby

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

NC-B

Bldg. 2019-00

Boiling tubs

Fill with nitrated cellulose 8 hrs

Wash with filtered water 1-2 hrs

warm up period (preheat) 2-8 hrs (4hr avg)

\* Acid boil 25-105 hrs

wash

preheat

\* Net boil 5 hrs

wash

preheat

\* Net boil 5 hrs

wash

Heat recovery system:

Hot waste water is drained from boiling tubs into wastewater tank - filtered water is passed through a heat exchanger in this tank before entering the tubs for the <sup>wash?</sup> warm up period.

The lids on the boiling tubs do not seal at all - they occasionally boil over.

PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Location of Equipment: Area: NC-B; Bldg. #: 2022-00

Process Line Description: Nitrocellulose manufacture -  
Jordan Beaters - receives nitrated cellulose (or pulp)  
from the boiling tub house

Description of Equipment: 6 Jordan Beaters (adapted from  
the paper industry) and 6 storage/transfer tanks with  
pumps and agitators - see back for schematic

Equipment Specifications: Mfg: Nobel & Wood  
Machine Co.; Model: Mammoth Jr.

Operating Data: Capacity: 11000 ~~parts gal~~ <sup>Type D</sup> (lbs) / 1.5 hr pulp  
2.5 hr cotton

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: Yes (No); HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: Manual

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: pumps and tank agitators  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Location of Equipment: Area: NC-B; Bldg. #: 2024-00

Process Line Description: Nitrocellulose Manufacture -  
Poacher and Blending House - receives NC from  
Jordan Beaters.

Description of Equipment: Stainless steel tubs with  
steam heat and agitators (2 motors, 1 for each side of  
the building

Equipment Specifications: Mfg: —; Model: —

Operating Data: Capacity: 11000 parts gal (lbs) / tub

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: —

Input: — CFM @ — psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: —

Process Heating: (Yes) No; HW or (Steam) from PH # 1

Input: — #/hr, gpm; Temp: 96 (F) (C)  
~205°F

Process Cooling: Yes (No); Chiller ID: —

Input: — gpm; CW Temp: — (S) — (R)

Operation Schedule: Daily: 24 hr (3-5 tubs); Annual: —

Control System: Manual

Operating log available: (Yes) No; Copies Obtained: Yes No

Auxiliary Equipment: pumps, agitators for tanks  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors, tank insulation, heat recovery

Heat Recovery Potential: Use system similar to Boiling Tub House  
Accessibility, heat source/load nearby

# SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11-7-89

Poacher & Blending House

Bldg. # 2024-00

Load NC From Jordan Beater house 1.5-2.5 hrs

let settle 1 hr

drain excess water + add soda ash

warm up tank (preheat to 96°C) 2.5 hr

Soda Boil 4 hr

Wash 15 min

settle 1 hr

drain 15-30 min

preheat 30-60 min

Boil 2 hr

Wash/settle/drain/preheat 2-3 hrs

Boil 1 hr

Wash/settle/drain/preheat 2-3 hrs

Boil 1 hr

NC From various poacher tubs sent to blender tubs in amounts <sup>as</sup> required for the different end products.

About 18 tubs are used



# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: NC-B; Bldg. #: 2026-00

Process Line Description: Nitrocellulose manufacture -  
Final Wringer House - NC from poacher/blenders is  
loaded into holding tanks, then to wringers to remove H<sub>2</sub>O.

Description of Equipment: 2 holding tanks and 8  
Wringer machines. 2-3 wringers are used at  
any one time. RAAP # RFA 5346

Equipment Specifications: Mfg: <sup>American</sup> Mach. & Metals; Model: S# T3248 A

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If <sup>25 HP</sup> yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: Yes (No); HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs / 5 days; Annual: \_\_\_\_\_

Control System: Manual

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: 15 hp pump, agitators, conveyor (small motor)  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors

Heat Recovery Potential: None  
 Accessibility, heat source/load nearby

# LOW TEMPERATURE CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: COTTON B; Bldg. #: 2046-00  
3046-00

Service area or Loads: CONTROL HOUSE

## Compressors\*:

	Manuf	Type	Refrig	S-Press	D-Press	RAAP#
No. 1:	<u>FRICK</u>	<u>RECIP</u>	<u>A</u>			<u>117191</u>
No. 2:	<u>FRICK</u>	<u>RECIP</u>	<u>A</u>			<u>117192</u>
No. 3:	<u>FRICK</u>	<u>ROTARY</u>	<u>A</u>			<u>117193</u>
No. 4:	<u>FRICK</u>	<u>ROTARY</u>	<u>A</u>			<u>117194</u>

## Pumps\*:

	Manuf	Model	GPM	S-Press	D-Press	RAAP#
? Condenser:	<u>MONO</u>		<u>375</u>			
→ No. 2:	<u>MONO</u>		<u>375</u>			
? Ch. Water:	<u>DURIRON</u>		<u>193</u>			
→ No. 2:	<u>"</u>		<u>178</u>			

Cooling Tower\*: Manufacturer: ?; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets for all motors.

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: \_\_\_\_\_

Location of Equipment: Area: COTTON B; Bldg. #: 2046-00  
3046-00

Equipment Description/Use: COOLING TOWER FAN MOTOR

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B; Bldg. #: 2046-00  
3046-00

Equipment Description/Use: RECIP. COMPR. MOTOR

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: 05310 05599

Manufacturer: MARATHON

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 123 Phase 3 Hz 60

HP: 100; RPM: 1770; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: ONE IS STANDBY UNIT

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B ; Bldg. #: 2046-00  
3046-00

Equipment Description/Use: ROTARY COMPR. MOTOR

Process Line: \_\_\_\_\_

Motor Used For: COMPR. DRIVE

Motor Specifications: RAAP ID #: 05312 05311

Manufacturer: MARATHON

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 94 Phase 3 Hz 60

HP: 75 ; RPM: 1780 ; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No ; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: ONE IS STANDBY UNIT

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B; Bldg. #: 2046-00  
3046-00

Equipment Description/Use: CHILLED WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 10.5 Phase 3 Hz 60

? ~~HP: 7 1/2~~; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☐; Copies Obtained: Yes ☒ No ☐

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: ONE IS STANDBY UNIT

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B; Bldg. #: 2046-00  
3046-00

Equipment Description/Use: CONDENSER WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: 05918 05917

Manufacturer: WESTINGHOUSE

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 13.2 Phase 3 Hz 60

HP: 10; RPM: 1745; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: ONE IS STANDBY UNIT

CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: COTTON B; Bldg. #: 2050-00

Service area or Loads: COOL MOLECULAR SIEVE

Chiller Specifications: Type: RECIP.; RAAP ID #: \_\_\_\_\_

Manufacturer & Model #: CARRIER 30HK

Operating Data: Capacity: \_\_\_\_\_

CHW Temps: \_\_\_\_\_ (supply), \_\_\_\_\_ (return)

Condenser Temps: \_\_\_\_\_ (sup), \_\_\_\_\_ (ret)

Compressor\*: Suction Pressure: \_\_\_\_\_; Discharge Pressure: \_\_\_\_\_

Refrigerant Type: \_\_\_\_\_; Motor Horsepower: \_\_\_\_\_

Pumps\*:

Manuf	Model	GPM	S-Press	D-Press	RAAP#
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Condenser:	_____	_____	_____	_____	_____
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Ch. Water:	_____	_____	_____	_____	<u>RFA 22619</u>
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Cooling Tower\*: Manufacturer: \_\_\_\_\_; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets For all electric motors \*

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: NEW CHILLER BEING INSTALLED  
AND NOT IN OPERATION AT PRESENT



ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B; Bldg. #: 2050-00

Equipment Description/Use: CONDENSER WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: 8298 6909

Manufacturer: TECO DELCO

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 20.5 Phase 3 Hz 60

HP: 15; RPM: 1775; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☒; Copies Obtained: Yes ☒ No ☒

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: \_\_\_\_\_

Location of Equipment: Area: COTTON B; Bldg. #: 2050-00

Equipment Description/Use: COOLING TOWER FAN MOTOR

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B ; Bldg. #: 2050-00

Equipment Description/Use: CHILLED WATER PUMP MOTORS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: 07662

Manufacturer: BALDOR

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 9.4 Phase 3 Hz 60

HP: 7 1/2 ; RPM: 3450 ; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No ; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: COTTON B; Bldg. #: 2050-00

Equipment Description/Use: RECIP. COMPRESSOR MOTOR

Process Line: \_\_\_\_\_

Motor Used For: COMPRESSOR DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 40 Phase 3 Hz 60

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: MOTOR CONCEALED IN NEW

HERMETIC COMPRESSOR ASSEMBLY

(INSTALLATION NOT COMPLETE)

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: NC-B; Bldg. #: 2500-00

Process Line Description: Nitrocellulose manufacture -  
Dehy Press House - NC From Final wringer house

Description of Equipment: 6 hydraulic presses to press  
out water and inject weak alcohol

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes ☒ No

Elect. Motor Drive: ☒ Yes <sup>- small pump motors</sup> ☐ No; If yes, complete motor form

Pneumatic Drive: ☐ Yes ☒ No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: ☒ Yes ☐ No; Pump ID: \_\_\_\_\_

Process Heating: ☐ Yes ☒ No; HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr,gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: ☐ Yes ☒ No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Operating log available: ☐ Yes ☐ No; Copies Obtained: ☐ Yes ☐ No

Auxiliary Equipment: 6 small alcohol pumps  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: None  
Accessibility, heat source/load nearby

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Building: Area: NC-B, Green; Bldg. #: 2506-00

Process or Activity: Diphenylamine (DPA) mix house

Process Equipment List: \_\_\_\_\_

- Insulated tanks for mixing and storage
- Low temperature (brine) chiller ~ 22°F
- Pump - M668

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): Incandescent

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 597

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: NC; Bldg. #: 2508-00

Process Line Description: Single base propellant manufact.  
NC Mix House. NC From Dehy press house to be  
mixed with ether & alcohol also added.

Description of Equipment: Beken mixers (4) in this  
building. Each uses a 60 hp motor and are cooled with  
chilled water (brine). Machines were adapted from baking ind.

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: 87 mixes parts gal lbs / shift

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, <sup>60hp</sup> complete motor form

Pneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: Yes (No); HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: (Yes) No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; <sup>brine</sup> ~~CW~~ Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs / 5 days; Annual: \_\_\_\_\_

Control System: Manual

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: Chiller (100hp comp.), chw pump (15hp)  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: NC; Bldg. #: 2510-00

Process Line Description: base propellant manufacture  
- Pre-Block and Horizontal Press House

Description of Equipment: Macaroni press(es). Hydraulic  
driven - used to extrude the NC to a specific  
shape.

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes No

Elect. Motor Drive: Yes No; If yes, complete motor form

Pneumatic Drive: Yes No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes No; Pump ID: \_\_\_\_\_

Process Heating: Yes No; HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr,gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: outside air heated w/steam and blown into  
Pumps, fans, heaters, blowers, etc bays.

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/10/90

Location of Building: Area: B-Line; Bldg. #: 2516-00

Process or Activity: Press and Cut House

5 similar bldgs. - Presses NC block to ropes and  
cuts to length

Process Equipment List: McKiernan-Terry Corp.

Horizontal press 2000-3000 psia 3 cyl/press  
540 cyl/da/bldg 2-3 min./press

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24h/da; Annual: 5da/wk

Lighting System Type(s): Mercury vapor and fluorescent  
- has been renovated

Controls: \_\_\_\_\_

Building Description: Age: 40 years; Number of Floors: 1

Gross SqFt (from bldg list): 3882

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Building: Area: NC-B; Bldg. #: 2521-00

Process or Activity: Hydraulic Pump house - supplies

3500 pound water pressure for process requirements.

Process support building

Process Equipment List: \_\_\_\_\_

• Hydraulic Pumps, 5 each - 2 large, 3 small - Worthington

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 hrs; Annual: 365 days

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 3246

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: NL-B, Green ; Bldg. #: 2555-00

Process Line Description: Single base propellant -  
Green lines - solvent recovery from building vapors.

Description of Equipment: Activated Carbon Filter System  
for solvent vapors. A fan (#RFA 5657) with 3 activated  
carbon beds (#RFA 5665), a preheater and a condenser.

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No ; If yes, complete motor form

Pneumatic Drive: Yes (No) ; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No) ; Pump ID: \_\_\_\_\_

Process Heating: (Yes) No ; HW or (Steam) from PH # 1

Input: 7 psi ~~#/hr, gpm~~ Temp: \_\_\_\_\_ (F,C)

Process Cooling: (Yes) No ; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: Automatic

Operating log available: (Yes) No ; Copies Obtained: Yes No

Auxiliary Equipment: 450 hp Fan motor  
Pumps, fans, heaters, blowers, etc

Potential ECM's: efficient motors, insulate building, precooler

Heat Recovery Potential: use incoming vapor to precool sat. vapor  
Accessibility, heat source/load nearby

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/10/90

Location of Building: Area: C-Line; Bldg. #: 3513-00

Process or Activity: Cutting and Press

Press NC from first press (cotton cylinder) 8 presses  
~400 blocks/day to rope ( $\frac{1}{2}$ " diam) cutters slice to  
~ $\frac{3}{4}$ " length

Process Equipment List: 8 Presses, 9 cutters

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 5da/wk; Annual: 24h/da

Lighting System Type(s): 90% incandescents in  
cutting area - at least 50 150 watt incandescent  
inside, 20 outside

Controls: \_\_\_\_\_

Building Description: Age: 40 years; Number of Floors: 2

Gross SqFt (from bldg list): 7230

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 7/18/89

CEB

Location of Chiller: Area: GREEN LINE; Bldg. #: 3523-00  
2523-00

Service area or Loads: SOLVENTS RECOVERY, MIX HOUSES,  
PROBABLY CUTTING HOUSES, AT TIMES PROVIDES CHW  
FOR CHILLER IN BLDG 2508 CONDENSER

Chiller Specifications: Type: CENT.; RAAP ID #: \_\_\_\_\_

Manufacturer & Model #: WESTINGHOUSE

Operating Data: Capacity: 350 TONS FLOW 1910 GPM

CHW Temps: 42 (supply), 46.4 (return)

Condenser Temps: 85 (sup), 95 (ret)  
1050 GPM

Compressor\*: Suction Pressure: \_\_\_\_\_; Discharge Pressure: \_\_\_\_\_

Refrigerant Type: \_\_\_\_\_; Motor Horsepower: \_\_\_\_\_

Pumps\*:

Manuf	Model	GPM	S-Press	D-Press	RAAP#
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Condenser:	_____	_____	_____	_____	_____
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Ch. Water:	_____	_____	_____	_____	_____
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Cooling Tower\*: Manufacturer: \_\_\_\_\_; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets For all electric motors \*

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: GOOD CONDITION

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: <sup>BEC</sup>GREEN LINE; Bldg. #: 3523-00  
2523-00

Equipment Description/Use: CENTRIFUGAL CHILLER MOTOR

Process Line: \_\_\_\_\_

Motor Used For: CHILLER DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

KW 283 Volts 460 Amps 394 Phase 3 Hz 60

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☒; Copies Obtained: Yes ☒ No ☒

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: MOTOR CONTROL CENTER PROVIDED  
WITH AMPERAGE METER WHICH INDICATED 140A?

MOTOR IS CONCEALED IN HERMETIC COMPRESSOR  
ASSEMBLY

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: BEC GREEN LINE; Bldg. #: 3523-00 2523-00

Equipment Description/Use: CHILLED WATER PUMPS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVES

Motor Specifications: RAAP ID #: 06599 08108

Manufacturer: GE (04/17/86) DELCO (09/27/89)

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 480 460 Amps 73.4 Phase 3 Hz 60

HP: 60; RPM: 1775; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

BEC

3523-00

Location of Equipment: Area: GREEN LINE; Bldg. #: 2523-00

Equipment Description/Use: CONDENSER WATER PUMPS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVES

Motor Specifications: RAAP ID #: 08024, 05830

Manufacturer: U.S. ELECTRIC - PACE MAKER

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ✓

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 32.4 Phase 3 Hz 60

HP: 25; RPM: 1760; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes (No); Copies Obtained: Yes (No)

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: U.S. ELECTRIC MOTOR TR. DATE

6/9/89 - PACE MAKER 11/21/86



ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: <sup>BEC</sup>GREEN LINE; Bldg. #: 3523-00  
2523-00

Equipment Description/Use: COOLING TOWER FAN MOTOR

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps 18 Phase \_\_\_\_\_ Hz \_\_\_\_\_

PER MOORHEAD HP: 75; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☐ No ☒; Copies Obtained: Yes ☐ No ☒

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: MOTOR CONTROL CENTER

INDICATED 18 AMPS?

COMPUTER PRINTOUT INDICATES 25 H.P.

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/11/90

Location of Building: Area: NG; Bldg. #: 3647-00

Process or Activity: Pre Mix

Process Equipment List: Mixer 180 mixes/da 2 min/mix  
use pneumatic drives - electric motors are remote

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24 h/da; Annual: 5da/wk

Lighting System Type(s): Fluorescents

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 793

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: NG NDI; Bldg. #: 3805-00

Service area or Loads: NG PROCESS

Chiller Specifications: Type: RECIP.; RAAP ID #: 126070  
126069

Manufacturer & Model #: 2-TRANE 87B60L3278  
A7C60L1167

Operating Data: Capacity: \_\_\_\_\_

CHW Temps: \_\_\_\_\_ (supply), \_\_\_\_\_ (return)

Condenser Temps: \_\_\_\_\_ (sup), \_\_\_\_\_ (ret)

Compressor\*: Suction Pressure: \_\_\_\_\_; Discharge Pressure: \_\_\_\_\_

Refrigerant Type: \_\_\_\_\_; Motor Horsepower: \_\_\_\_\_

## Pumps\*:

Manuf	Model	GPM	S-Press	D-Press	RAAP#
Condenser:	<u>2-4X3</u>	<u>280</u>			<u>@ 88'</u>
	<u>2-3X2</u>	<u>200</u>			<u>@ 180' HD</u>
Ch. Water:	<u>2-15X1</u>	<u>65</u>			<u>@ 180' HD</u>

(9451)(9452)  
(9210)(9170)  
(9211)(9212)

Cooling Tower\*: Manufacturer: \_\_\_\_\_; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets For all electric motors \*

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Operating log available: Yes (No); Copies Obtained: Yes (No)

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO 1; Bldg. #: 3805-00

Equipment Description/Use: CHILLED WATER PUMP MOTORS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 9209 M (9210 or 9170)

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: DIRECT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 23 Phase 3 Hz 60

HP: 20; RPM: 3500; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☒; Copies Obtained: Yes ☒ No ☒

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO1; Bldg. #: 3805-00

Equipment Description/Use: CHILLED WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 9211 M 9212

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps \_\_\_\_\_ Phase 3 Hz 60

HP: 10; RPM: 3500; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO1; Bldg. #: 3805-00

Equipment Description/Use: CONDENSER WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: M 9451 9452

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 19.5 Phase 3 Hz 60

HP: 15; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO1; Bldg. #: 3805-00

Equipment Description/Use: COOLING TOWER FAN MOTOR

Process Line: \_\_\_\_\_

Motor Used For: FAN DRIVE

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 6/90

Location of Building: Area: HORSESHOE ; Bldg. #: 4329

Process or Activity: STEAM GENERATION - SIX, 25,000#/HR  
B&W, STOKER COAL FIRED, 150 PSIG SAT.

Process Equipment List: \_\_\_\_\_

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 H/D ; Annual: 8760 H/YR

Lighting System Type(s): MIXED FLUORESCENT & INCAND.

Controls: PNEUMATIC - POOR CONDITION

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 10,440

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



# BOILER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 2/ 190

Location of Boiler: Area: Power House No2; Bldg. #: 4329-00  
Service Area or Loads: "HORSE SHOE"

Boiler Specifications: Type: stoker; RAAP ID #: \_\_\_\_\_  
Manuf & Model #: BFW TYPE H  
Operating: Capacity: 33,000; Press: 150 psi g  
Fuel(s) used: Type: stoker Coal; Input: \_\_\_\_\_  
Steam produced: \* 20,000 LBS/hour; Temp: SAT (F)  
Hot water produced: Flow Rate: —; Temp: — (F)  
Other data: Stack Gas Temp \_\_\_\_\_; Excess Air % \_\_\_\_\_  
Burner Type: stoker - UNDER FEED

Operation Schedule: Daily: 24 hr/day  
Annual: \_\_\_\_\_

Percent Loaded: Summer \_\_\_\_\_ Fall/Spring \_\_\_\_\_ Winter \_\_\_\_\_

Control System: PNEUMATIC, COORDINATED - CURRENTLY  
NOT WORKING WELL AT ALL.

Maintenance Schedule: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Feed Water Pretreatment: Heated: Yes No; Chemicals: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Pumps, Etc. \_\_\_\_\_  
Economizer \_\_\_\_\_  
Scrubber \_\_\_\_\_  
Soot Blower \_\_\_\_\_

Condensate Return: % (Est): 4-6; From \_\_\_\_\_

General Condition/Comments: \* LIMITED BY STACK CAPACITY.  
FACILITY TO BE RETIRED BY 1995.

## BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 6/90

Location of Building: Area: GENERAL PLANT; Bldg. #: 421-00  
4903-00

Process or Activity: INERT GAS GENERATION (IGG)

Process Equipment List: 2-15000 SCFH IGA'S ; 1-60,000 IGA  
1 PILLOW TANK, 2-300 psi INVERSOR RAND Compressors,  
1-320 psi IR compressor

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 H/D; Annual: 8760 H/yr

Lighting System Type(s): INCANDESCENT

Controls:

Building Description: Age: 36 years; Number of Floors:       

Gross SqFt (from bldg list): 557

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: NC-C, Green ; Bldg. #: 4906-00

Process or Activity: Final mix house - mixers used  
to blend NC and NG into multibase propellant.

Process Equipment List: \_\_\_\_\_

- 8 mixers (2 blade), 1 motor for each blade
- Chiller
- Hot water converter with 1hp circ. pump

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 3 shifts ; Annual: 260 days

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 3682

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-9-89

Location of Building: Area: NC-C, Green; Bldg. #: 4908-00

Process or Activity: Press and Cutting house - Multibase  
propellant pressed and cut

Process Equipment List: \_\_\_\_\_

- Verticle press with hot water jacket (140°F)
- Hydraulic pumps
- Hot water converter with 1/2 hp circ. pump
- Exhaust system.

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 5337

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket - Extr.; Bldg. #: 4912-03

Process or Activity: Sawing and Inhibiting - MK90 is  
milled on one end, cut to length, and an end inhibitor  
is glued to the propellant.

Process Equipment List: \_\_\_\_\_

- Saw & Mill - Motor M-~~6246~~
- AHU - RFA 7588, M 2133
- Exhaust system for ELBA solvent fumes

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 1 shift, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): Explosion Proof

- 26 - 2 tube - 40w Fluorescents
- 4 - 150 w incandescents

Controls: Interior and exterior lights on on  
the same switch

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 2487

HVAC system(s) used for: Personal Comfort / \*Process Requirement\*

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket -Cast; Bldg. #: 4912-04

Process or Activity: Casting - remote operation  
controlled from bldg #4922. Molds with base grain are  
weighed, evacuated (vacuum), and NG mixture from  
NG#2 is pumped in 1 skid (8 molds) at a time.

Process Equipment List: \_\_\_\_\_

- Dessicator - 1000 lbs NG mixture tank
- Vacuum Pumps - 10 of these RFA 7564, M 1395 (3hp)
- Compressor - RFA 8214, M 1507 (15hp)
- Chiller - RFA 16324, M 5273
- AHU - RFA 7721

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 3 shifts, 3 days; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

6 - 3 lamp Fluorescents (40w) are located  
outside the building.

Controls: \_\_\_\_\_

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 2498

HVAC system(s) used for: Personal Comfort / \*Process Requirement\*

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4912-07

Process or Activity: Pin assembly and conditioning.

Insert pins in reamed end of Tow Launch - cure at  
125°F, condition at 70°F @ 50% RH, cure at 125°F

Process Equipment List: \_\_\_\_\_

• Chiller - RFA 13277

• AHU - RFA 13275, M4489

• 6 heating/curing bays, Fan - RFA 8121

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 hrs, 7 days; Annual: \_\_\_\_\_

Lighting System Type(s): 3-2 tube ~~extra~~ Fluorescents inside,  
15-3 tube Fluorescents outside

Controls: \_\_\_\_\_

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 2472

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4912-11

Process or Activity: Loading House - Molds From mold  
assembly are filled with base grain

Process Equipment List: Area maintained at 70°F

Chiller - RFA 16319

AHU - Fan motor (M-1453) operates 24 hrs/day  
7 days per week

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 3 days, 3 shifts; Annual:     

Lighting System Type(s): Incandescent ~ 6-150w Fixtures

Controls:     

Building Description: Age: 47 years; Number of Floors:     

Gross SqFt (from bldg list): 2428

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4912-15

Process or Activity: Spiral Wrap - wraps inhibitor  
tape around MK90 grain after it leaves powder bed.  
So grain will burn from the inside to the outside

Process Equipment List: \_\_\_\_\_

- AHU-TRANE, 5hp Fan, steam preheat + heat coils, chw coil  
preheat pipes are outside
- ELBA Solvent Fume ventilation system
- Hydraulic pump - M6238 (7hp)
- ELBA Solvent tanks/pumps - 3 each, 2hp each

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 1 shift, 4 days; Annual: \_\_\_\_\_

Lighting System Type(s): HID's and Fluorescents.  
2 exterior incandescents were on during day.

Controls: \_\_\_\_\_

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 2295

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4912-27

Process or Activity: Cure Grain - Carpet rolls, Tow Launch, RAP8" and M180 propellant is put on trays and cured for 24-172 hours at 125°F to 140°F.

There are 10 buildings like this one.

Process Equipment List: Similar to FAD's  
• AHU with steam heat coil

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 24 hrs, 7 days; Annual:     

Lighting System Type(s): Each Bay has 5 exterior flood lights shining in through "windows."

Controls:     

Building Description: Age: 47 years; Number of Floors: 1

Gross SqFt (from bldg list): 2438

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: Pilot-B; Bldg. #: 4912-40

Process or Activity: Forced Air Dry

Multi-base propellant is dried in buildings by  
once through air heated to 140°F

Process Equipment List: 2-10hp fan motors, 1 for each  
side of building (2 bays)

2 steam heating coils (40 lb) and 2 steam pre-  
heat coils

Space Utilization: Industrial Process: 100%; Other:       %

Schedule: Daily: 24-200 hr cycles; Annual:       

Lighting System Type(s): 2 lamp (40w) fluorescent in  
each bay. Incandescent flood lighting outside: 6  
lamps - 150w each

Controls: Thermocouple located in the bay - high  
temperature limit is set at 155°F

Building Description: Age: 47 years; Number of Floors: 1

Gross SqFt (from bldg list): 2438

HVAC system(s) used for: Personal Comfort / \*Process Requirement\*

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4915-00

Process or Activity: Mold Assembly - 8" RAP

Fiberglass tubes are purchased, hoses and other parts  
are assembled and inspected

Process Equipment List: Manual Operations

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 3 days, 3 shifts; Annual:     

Lighting System Type(s): Not Exp. Proof

- incandescent & Fluorescent fixtures
- change 7 incand. fixt. to Fluorescents in the  
hose cut & inspection area

Controls: thermostat for forced air steam  
heating system

Lighting control by breaker switcher - not well marked

Building Description: Age: 37 years; Number of Floors: 2

Gross SqFt (from bldg list): 5564

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4921-00

Process or Activity: Inspect and clean NG dessicators  
(stainless steel tanks)

Process Equipment List: Manual Operation

3 forced air, steam unit heaters

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 3 days, 3 shifts; Annual:     

Lighting System Type(s):     

21 - 150 w incandescents - mounted 20ft + high

Controls:     

Building Description: Age: 37 years; Number of Floors:     

Gross SqFt (from bldg list): 4445

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket-; Bldg. #: 4924-01

Process or Activity: Motor loading - Manual Operation

Mark 90 - extruded grain

M1 TOW - 4 Grains from Green Line

M1B0 - 72 Grains from Green Line

Process Equipment List: HVAC only equipment.

- Carrier 39BA050 AHU, 3 hp Fan motor

- Carrier 39BA009 Condenser; 460v, 17.8A Compressor

460v, 1.8A Fan

Space Utilization: Industrial Process: 100 %; Other:        %

Schedule: Daily: 1 shift, 5 days; Annual:       

Lighting System Type(s): - TOW loading: 6-3 lamp Fl's

- Loading area: 30 2 1/2 3 lamp Fl's and 3-150 w incand.

- Mechanical Room: 1-150w incand.

- 1 incandescent exterior light on during day

Controls: Mostly for humidity - area is kept at  
70°F and 50% RH.

Building Description: Age: 48 years; Number of Floors:       

Gross SqFt (from bldg list): 5335

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4924-05

Process or Activity: Dowel Rod - MK 90 with end  
inhibitor is loaded into bay 1 and comes out of bay 3  
with the diameter milled down. The O.D. is then  
checked. Area is maintained at 70°F.

Process Equipment List: \_\_\_\_\_

• Mill

• Conveyor

• HVAC

Space Utilization: Industrial Process: 100%; Other: \_\_\_\_\_%

Schedule: Daily: 1 shift, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): Explosion Proof  
14-2tube Fluorescents  
8 incandescents

Controls: \_\_\_\_\_

Building Description: Age: 47 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 3617

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4924-06

Process or Activity: Mills the end and reams a hole  
in M180 and Tow Launch grains, Manually loaded.

Much of this space is not used but all is Air Conditioned.

Process Equipment List: • M180 Reamer - pneumatic drive  
• Tow Launch Reamer - pneumatic drive  
• AHU with steam preheat + steam heat coils, Fan M 5056  
• Chillers - RFA 15282 & RFA 15283, 440 volt  
- Trane CGAC 65C, Chw pump MFA 15238, 7.5hp

One Chiller running while outside air temp. is 50°F.

Space Utilization: Industrial Process: 30 %; Other: 70 %

Schedule: Daily: 3 shifts, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): 6 incandescent exterior lights on  
during day. M180 area - 18-3 tube Fluorescents (turn  
off or disconnect 6 of these in hallway) - Tow Launch -  
12-3 tube Fluorescents (5 in hallway)

Controls: \_\_\_\_\_

Building Description: Age: 47 ~~88~~ years; Number of Floors: 1

Gross SqFt (from bldg list): 5594

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4925-00

Process or Activity: MK90 Finishing - 50 operations.

① Conditioned at 70°F for 16 hours, ② trim cuffs, ③ Coned by reamer, ④ glue sleeve on coned end and ⑤ inspection and packout. 70°F required

Process Equipment List: \_\_\_\_\_

• Cuff Trimmer

• Coner

• Chiller and steam heat for entire building

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 1 shift, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): Fluorescents mostly. 4 incand. located in conditioning bay.

Controls: \_\_\_\_\_

Building Description: Age: 26 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 5859

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-10-90

Location of Building: Area: Rocket; Bldg. #: 4951-02

Process or Activity: M7 Tow Launch and M180 grains  
are cut to length. The grains are manually  
loaded on the saw and then cut from a  
control room.

Process Equipment List: \_\_\_\_\_

- Dickerson Saw - M6149 (3hp, Reliance)
- Semi-automatic grain feeder - has never worked
- Steam radiator comfort heat - manual valve

Space Utilization: Industrial Process: 75 %; Other: 25 %

Schedule: Daily: 3 shifts, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): Explosion proof

- 8 incandescent
- 1-3 tube-40w Fluorescent

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 618

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: Rocket (Extru.); Bldg. #: 5008-01

Process or Activity: 15 inch Press House. Press (extrude)

carpet rolls from rolled powder & cut them to length.

- Bldg #5008-02: 11 1/4 inch & 15 inch press & cut.

- Bldg #5008-03: 4 inch & 15 inch press and cut.

Process Equipment List: • Farquhar Press RFA 12052

• 6 exhaust ventilators (new) M9196-99, M9299

• AHU w/ steam heating coil (new) RFA 26570, M9300

• Oilraulic Pumps (50hp & 30hp)

• Vacuum Pump

• Hot water Converters, 150°F & 170°F

Space Utilization: Industrial Process: 100 %; Other:        %

Schedule: Daily: 24 hours, 5 days; Annual:       

Lighting System Type(s): Exp. Proof Fixtures

12 - 2 lamp 40w Fluorescents

2 incandescents - not necessary

Controls: Die kept at 170°F, Basket kept at 150°F

Ventilation system shut down on weekends - heating systems are not.

Building Description: Age: 47 years; Number of Floors: 1

Gross SqFt (from bldg list): 1751

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: Igniter Line ; Bldg. #: 5010-00

Process or Activity: Inspect igniters for M-180 and  
M-76 TOW Launch rockets

Process Equipment List:

Chiller-RFA 8401, M1713 Very Old System

Steam Heater-RFA 8400

Compressor-M1715 (25hp)

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 1 shift, 5 days ; Annual:     

Lighting System Type(s):     

M180 area: 4-150w incand, 6-3lamp 40w fl's, 1-2lamp 40w fl

M76 area: 4-150 w incand, 13-3lamp 40w Fluorescents

Controls: Wall thermostat set at 70°F

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 1611

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: 1ST ROLL Powder; Bldg. #: 6304-00

Process or Activity: PASTE BLENDING - INCANDESCENT  
LIGHTS LEFT ON DURING DAYLIGHT HOURS - NO  
SWITCH TO SHUT OFF LIGHTS

Process Equipment List: ONE BLENDER - ONE EXHAUST FAN

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 24 H/D / 5d/wk; Annual: 260 d/yr

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 1250

HVAC System(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/9/90

Location of Building: Area: 1<sup>st</sup> R.P.; Bldg. #: 6304-00

Process or Activity: Blending Blender House

Powder receive from green lines, mixed with chemicals  
blends for 20 min. - 1 batches/da - 3 shifts/da

Process Equipment List: \_\_\_\_\_

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24h/da; Annual: 5da/wh

Lighting System Type(s): at least 20 100 watt  
incandescents on 24h/da

Controls: \_\_\_\_\_

Building Description: Age: 46 years; Number of Floors: 1

Gross SqFt (from bldg list): 1250

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: 1ST Roll Powder Bldg. #: 7104-00

Process or Activity: PRE-ROLL - DIFFERENTIAL & EVEN  
SPEED ROLL HOUSE - MACHINE ROLLS ARE STEAM HEATED  
TO HELP DRY MATERIAL

Process Equipment List: \_\_\_\_\_

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 24 h/6 5 d/wk; Annual: 260 d/yr

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of floors: \_\_\_\_\_

Gross SqFt (from bldg list): 7158

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/9/90

Location of Building: Area: 1<sup>st</sup> RP; Bldg. #: 7104-00

Process or Activity: Differential and Even Speed Roll House  
5 similar bldg, using 4 ~~E.S. Rollers~~ Powder is  
rolled to form carpet

Process Equipment List: E.S. Rollers used for scrap  
rerun - Rolls are heated

D.S. Rollers used for scratch product - continuously  
ventilated

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24 h/da; Annual: 5 da/wk

Lighting System Type(s): Fluorescents

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 7158\*

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: Rocket; Bldg. #: 7106-06

Process or Activity: Packing materials (cardboard) are  
dried by blowing 147°F air over them for a  
minimum of 24 hours. Similar to FAD's. Building  
7106-04 is similar but is used to cure grain.

Process Equipment List: \_\_\_\_\_

• AHU - RFA 9126 with steam heat - no preheat

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24hr, 7 days; Annual: \_\_\_\_\_

Lighting System Type(s): No interior lights -  
8-150w incandescent floods and 1 incandescent bulb  
for exterior lighting - on during day

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 858

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: 1st RP, F-line; Bldg. #: 7113-00

Process or Activity: Processes rolled powder through  
pre-roll and even-speed roll to be used by 1st  
rolled powder in the production of carpet rolls.

Process Equipment List: \_\_\_\_\_

- Pre-roll machines, 3 ea
- Even speed roll machines, 2 ea
- AHU - RFA 8729, M 1895 & 15 exhaust fans
- Hot water Converters - pre/roll ~ 208°F  
Even speed ~ 154°F

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): Incandescent

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 19,478

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: Rocket-Cast; Bldg. #: 7113-00

Process or Activity: Sawing and Maching - # operations  
on 8" RAP Grain. ① Billit Saw into 7 sections, ② Face to  
exact length on lathe #2, ③ glue on end inhibitor and  
④ Bore & cone hole and trim edge on lathe #1

Process Equipment List: \_\_\_\_\_

• Billit Saw - RFA 20636

• Lathe #1

• Lathe #2

Product will be discontinued by end of June, 1990

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 5 days, 1 shift; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 19,478

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-9-90

Location of Building: Area: 1ST ROLL Powder; Bldg. #: 7127-00

Process or Activity: CARPET ROLL

Process Equipment List: SLITTER 38.5 LB ROLLS

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 84 H/D, 5 d/w; Annual: 260 d/yr

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 49 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 1356

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4/9/90

Location of Building: Area: 1<sup>st</sup> RP; Bldg. #: 7127-00

Process or Activity: Slitter & "Carpet" Roll

3 similar bldgs - End product taken to  
magazine - then to Squirrel Hollow (Pilot A)  
extruders

Process Equipment List: Slitter ~~cut~~ cuts carpet into  
4" wide piece - Rolled to 15" diam

Space Utilization: Industrial Process: 100 %; Other: 0 %

Schedule: Daily: 24h/da; Annual: 5da/wk

Lighting System Type(s):

Controls:

Interviewed Bart Compton

Building Description: Age: 49 years; Number of Floors: 1

Gross SqFt (from bldg list): 1356

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: Rocket - Ext; Bldg. #: 7801-00

Process or Activity: Extruded rocket finishing  
operations. (1) Bevel, mill and counter sink  
operations

2/3 of building (RAP 155) area not used - heat + light on

Process Equipment List: \_\_\_\_\_

• Lathe #3 - J&L - Beveling

• Lathe #1 - J&L - Facing & counter sink (cone)

Space Utilization: Industrial Process: 35 %; Other: 65 %

Schedule: Daily: 1 shift, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): Explosion Proof  
Fluorescent and incandescent

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 5707

HVAC system(s) used for: Personal Comfort / Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: N.G. / TNT SLURRY; Bldg. #: 9304-00

Process or Activity: MIXING N.C. WITH N.G.

Process Equipment List: SEE ATTACHED SKETCH

3 SPEED MOTOR; NOT VISIBLE - ESTIMATED HP = 100

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: 3 hrs / shift 15 shifts / wk; Annual: 2340 hrs / yr

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 36 years; Number of floors: \_\_\_\_\_

Gross Floor Area: 3525 s.f.

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

## PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89Location of Equipment: Area: RP-4; Bldg. #: 9309-03Process Line Description: Rolled Powder manufacture -  
Pre-roll or differential rollDescription of Equipment: Rolling machine to take  
powder mix and Flatten it for further processingEquipment Specifications: Mfg: <sup>Phil.</sup>Gear Works; Model: \_\_\_\_\_Operating Data: Capacity: 400 ~~parts gal~~ (lbs) / shiftRoom temp / RH control reqd: Yes NoElect. Motor Drive: (Yes) No <sup>50 hp</sup>; If yes, complete motor formPneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes No; Pump ID: \_\_\_\_\_Process Heating: (Yes) No; HW or Steam from PH # \_\_\_\_\_Input: \_\_\_\_\_ #/hr, gpm; Temp: 210 (F,C)Process Cooling: (Yes) No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs; Annual: \_\_\_\_\_Control System: AutomaticOperating log available: Yes No; Copies Obtained: Yes NoAuxiliary Equipment: steam heat AHU in A9303-3, HW converters  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby



# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: RP-4; Bldg. #: 9309-03

Process Line Description: Rolled Powder Manufacture -

Description of Equipment: Even speed roll machines (3) -  
rolls propellant flat RAAP # RFA 8571. Three machines  
per building - 4 buildings in RP-4.

Equipment Specifications: Mfg: Link Belt; Model: \_\_\_\_\_

Operating Data: Capacity: ~ 20 parts gal-lbs / 5min

Room temp / RH control reqd: Yes No

Elect. Motor Drive: (Yes) No; <sup>30hp #M3484</sup> If yes, complete motor form

Pneumatic Drive: Yes (No); Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: (Yes) No; (HW) or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr,gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hr; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: also steam space heat  
transport cabinets heated w/HW to 130°F  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: Accessibility, heat source/load nearby

PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: RP-4; Bldg. #: 9309-03

Process Line Description: Rolled Powder manufacture -

Description of Equipment: Slitter / carpet roll machine  
Powder is rolled + cut. Table is heated with  
steam to keep powder workable.

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes No

Elect. Motor Drive: Yes No; If yes, <sup>3 hp</sup> complete motor form

Pneumatic Drive: Yes No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes No; Pump ID: \_\_\_\_\_

Process Heating: Yes No; HW or Steam <sup>-heats roll table</sup> from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hr @ 50%; Annual: \_\_\_\_\_

Control System: Manual

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: Compressor  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

SITE SURVEY NOTES

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

RP-4

Bldg 9309-03

- Hot Water Converters -

Service/Load	Supply Temp.	RAAP#	Pump Motor
Even Speed	157 °F	8581	3hp
Pre Roll	210 °F	8575	3hp
Roll Cabinets ?	144 °F	8582	?

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: 4th RP; Bldg. #: 9309-04

Process or Activity: Rolled power and increment  
production.

Process Equipment List: Preroll - RFA 13323, Even Speed  
roll - RFA 8844, Slitter - RFA 9372, Carpet roll - RFA 9370,  
Final roll, sheet press - RFA 9150, Sewing machines, incre.  
Slitter - RFA 8645, Punch press, Classifier.

Hot Water Converters: Pre roll ~ 210°F

Even speed ~ 157°F

Space Utilization: Industrial Process: 100 %; Other:      %

Schedule: Daily: 1 shift, 5 days; Annual:     

Lighting System Type(s):     

Incandescent in Carpet roll area.

Fluorescent and incandescent in increment area.

Controls:     

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 22,829

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: RP-4; Bldg. #: 9310-02

Process Line Description: Rollad Powder Manufacture

Description of Equipment: Final Roll Machine - 5 bays,  
one machine in each bay - rolls powder to final  
thickness

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: (Yes) No

Elect. Motor Drive: (Yes) No <sup>#M 2107</sup>; If yes, complete motor form

Pneumatic Drive: Yes No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes (No); Pump ID: \_\_\_\_\_

Process Heating: (Yes) No; (HW) or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: 170 (F) C

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 8 hr - continuous; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: bays are steam (forced air) heated to maintain  
pumps, fans, heaters, blowers, etc  
workability of powder

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: Accessibility, heat source/load nearby

PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: RP-4; Bldg. #: 9310-02

Process Line Description: Rolled Powder

Description of Equipment: Shear press

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: \_\_\_\_\_ parts gal lbs / \_\_\_\_\_

Room temp / RH control reqd: Yes No

Elect. Motor Drive: Yes No<sup>1hp</sup>; If yes, complete motor form

Pneumatic Drive: Yes No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: Yes No; Pump ID: \_\_\_\_\_

Process Heating: Yes No; HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr,gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes No; Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Accessibility, heat source/load nearby

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 4-11-90

Location of Building: Area: 4th RP; Bldg. #: 9334-15

Process or Activity: Blending - NG and NC slurry mixed  
with other chemicals.

Steam radiator heat - no temp control

Process Equipment List: \_\_\_\_\_

- Blender - RFA 12724, RFA 12725
- Hydraulic Pump and motor
- EXhaust Fan
- Steam heat for fire protection system

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 3 shifts, 5 days; Annual: \_\_\_\_\_

Lighting System Type(s): 6-3 tube fluorescents,  
4 exterior incandescents on during day.

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 600

HVAC system(s) used for: Personal Comfort \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# PROCESS EQUIPMENT DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Equipment: Area: RP-4; Bldg. #: 9334-15

Process Line Description: Rolled Powder - Blender House

Description of Equipment: Blender

Equipment Specifications: Mfg: \_\_\_\_\_; Model: \_\_\_\_\_

Operating Data: Capacity: 800 ~~parts gal~~ lbs +

Room temp / RH control reqd: Yes (No)

Elect. Motor Drive: (Yes) No; If yes, complete motor form

Pneumatic Drive: Yes No; Compressor ID: \_\_\_\_\_

Input: \_\_\_\_\_ CFM @ \_\_\_\_\_ psi(a,g)

Hydraulic Drive: (Yes) No; Pump ID: \_\_\_\_\_

Process Heating: Yes (No); HW or Steam from PH # \_\_\_\_\_

Input: \_\_\_\_\_ #/hr, gpm; Temp: \_\_\_\_\_ (F,C)

Process Cooling: Yes (No); Chiller ID: \_\_\_\_\_

Input: \_\_\_\_\_ gpm; CW Temp: \_\_\_\_\_ (S) \_\_\_\_\_ (R)

Operation Schedule: Daily: 24 hrs ↓; Annual: \_\_\_\_\_

Control System: Automatic - runs 5 cycles per shift (3 shifts)

Operating log available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: hydraulic pump (20hp), exhaust system  
Pumps, fans, heaters, blowers, etc

Potential ECM's: \_\_\_\_\_

Heat Recovery Potential: None

Accessibility, heat source/load nearby



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Building: Area: 4th RP; Bldg. #: 9334-17

Process or Activity: Rest House - paste from rest houses in magazine area to here where mix waits for blender operation. 8 buildings are similar - 7 of them are active.

Process Equipment List: \_\_\_\_\_

• Steam radiator heat - manual control valve

70°F - 120°F temperature requirements

Space Utilization: Industrial Process: 100 %; Other: \_\_\_\_\_ %

Schedule: Daily: 24 hrs; Annual: 365 days

Lighting System Type(s): Fluorescent

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: 1

Gross SqFt (from bldg list): 600

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-8-89

Location of Building: Area: 4th RP; Bldg. #: 9354-00

Process or Activity: Compressors - supply compressed  
air to 4th rolled powder area.

Process Equipment List: \_\_\_\_\_

Compressors - Worthington, 440v, 100hp  
water cooled

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 48 years; Number of Floors: \_\_\_\_\_

Gross SqFt (from bldg list): 1200

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*

# LOW TEMPERATURE CHILLER DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Chiller: Area: NG NO2; Bldg. #: 9465-00

Service area or Loads: GLYCERIN SODA SOL REFR. HOUSE

## Compressors\*:

	Manuf	Type	Refrig	S-Press	D-Press	RAAP#
No. 1:	<u>FRICK</u>	<u>8X8</u>	<u>A</u>			<u>RFA 21302</u>
No. 2:	<u>FRICK</u>	<u>8X8</u>	<u>A</u>			<u>RFA 21302</u>
No. 3:						
No. 4:						

## Pumps\*:

	Manuf	Model	GPM	S-Press	D-Press	RAAP#
Condenser: 1						
No. 2:						
Ch. Water: 1			<u>160 @ 146'</u>			
No. 2:			<u>160 @ 146'</u>			

Cooling Tower\*: Manufacturer: \_\_\_\_\_; Model: \_\_\_\_\_

\* Fill out Electric Motor Data sheets for all motors.

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Heat Recovery Potential: \_\_\_\_\_  
Condenser accessible, heat load nearby

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO 2; Bldg. #: 9465-00

Equipment Description/Use: COOLING TOWER MOTOR

Process Line: \_\_\_\_\_

Motor Used For: \_\_\_\_\_

Motor Specifications: RAAP ID #: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts \_\_\_\_\_ Amps \_\_\_\_\_ Phase \_\_\_\_\_ Hz \_\_\_\_\_

HP: \_\_\_\_\_; RPM: \_\_\_\_\_; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_

Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO2 ; Bldg. #: 9465-00

Equipment Description/Use: CONDENSER PUMP MOTORS

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: 02198 01256

Manufacturer: G.E.

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction \_\_\_\_\_

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 440 Amps 18.9 Phase 3 Hz 60

HP: 15 ; RPM: 1760 ; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No ; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO2; Bldg. #: 9465-00

Equipment Description/Use: CHILLED WATER PUMP MOTOR

Process Line: \_\_\_\_\_

Motor Used For: PUMP DRIVE

Motor Specifications: RAAP ID #: 04666 <sup>87</sup> 08773 <sup>86</sup>

Manufacturer: WESTINGHOUSE TOSHIBA

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: \_\_\_\_\_

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 25 Phase 3 Hz 60

HP: 20; RPM: 1750; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes No; Copies Obtained: Yes No

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

ELECTRIC MOTOR DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11/8/89

Location of Equipment: Area: NG NO2; Bldg. #: 9465-00

Equipment Description/Use: RECIP. COMPRESSOR MOTORS

Process Line: \_\_\_\_\_

Motor Used For: COMPRESSOR DRIVE

Motor Specifications: RAAP ID #: 07934 07935

Manufacturer: GE GE

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Type: Synchronous \_\_\_\_\_; Induction ☒

Drive Type: BELT

Efficiency: \_\_\_\_\_; Power Factor: \_\_\_\_\_

Insul. Class: \_\_\_\_\_; Service Factor: \_\_\_\_\_

Volts 460 Amps 91 Phase 3 Hz 60

HP: 75; RPM: 1775; Design: \_\_\_\_\_

Operation Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Control System: \_\_\_\_\_

Maintenance Schedule: \_\_\_\_\_

Manufac. specs available: Yes ☒ No ☐; Copies Obtained: Yes ☐ No ☒

Auxiliary Equipment: \_\_\_\_\_  
Variable speed drive, etc

General Condition/Comments: \_\_\_\_\_

BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-10-89

Location of Building: Area: NG #2; Bldg. #: 9467-00

Process or Activity: Generator House - Air compressors  
(old one) to supply plant air to NG area

Process Equipment List: \_\_\_\_\_

- Compressor - Ingersol Rand XLE, 250 hp Sync. motor
- water cooled

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 36 years; Number of Floors: 1

Gross SqFt (from bldg list): 930

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*



BUILDING DATA

RADFORD ARMY AMMUNITION PLANT

DATE: 11-10-89

Location of Building: Area: NG-2; Bldg. #: 9488-00

Process or Activity: Compressor House - new compressors  
to supply plant air to NG area

Process Equipment List: \_\_\_\_\_

- Compressors (2) - Centac, 2400 volt, 450hp, 126psi
- 15 Kw heater/dryer in each compressor
- Water cooled - 62°F in, 95°F out

Space Utilization: Industrial Process: \_\_\_\_\_%; Other: \_\_\_\_\_%

Schedule: Daily: \_\_\_\_\_; Annual: \_\_\_\_\_

Lighting System Type(s): \_\_\_\_\_

Controls: \_\_\_\_\_

Building Description: Age: 4 years; Number of Floors: 1

Gross SqFt (from bldg list): 1536

HVAC system(s) used for: Personal Comfort / \*Process Requirement

\* Complete Construction Data Sheet only if HVAC is for process \*